US007610699B2

(12) **United States Patent**
Boudreau

(10) **Patent No.: US 7,610,699 B2**
(45) **Date of Patent: Nov. 3, 2009**

(54) **ASSEMBLY FOR HARVESTING SHELLFISH SUCH AS SCALLOPS AND ALIKE**

(76) Inventor: **Marcel Gerard Boudreau**, P.O. Box 141, 70 Celtic Drive, St. Andrews, N.S. (CA) B0H 1X0

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/221,408**

(22) Filed: **Aug. 4, 2008**

(65) **Prior Publication Data**

US 2008/0295365 A1 Dec. 4, 2008

(51) **Int. Cl.**
A01K 73/00 (2006.01)

(52) **U.S. Cl.** **37/315**; 37/314; 43/9.4; 43/9.7; 56/8; 56/9

(58) **Field of Classification Search** 37/315, 37/316, 341, 314; 43/9.4, 9.7; 56/8, 9
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,508,087	A *	5/1950	Bailey	37/315
3,608,217	A *	9/1971	Voisin, Sr.	37/316
4,185,404	A *	1/1980	Hue et al.	37/314
4,646,448	A *	3/1987	Voisin	37/316
4,759,146	A *	7/1988	Le Beon et al.	43/4.5
4,813,377	A *	3/1989	Riche	37/316
5,024,009	A *	6/1991	Kirkman	37/316
6,953,528	B2 *	10/2005	Nesfield	210/747
2006/0236950	A1 *	10/2006	Patrick et al.	119/219

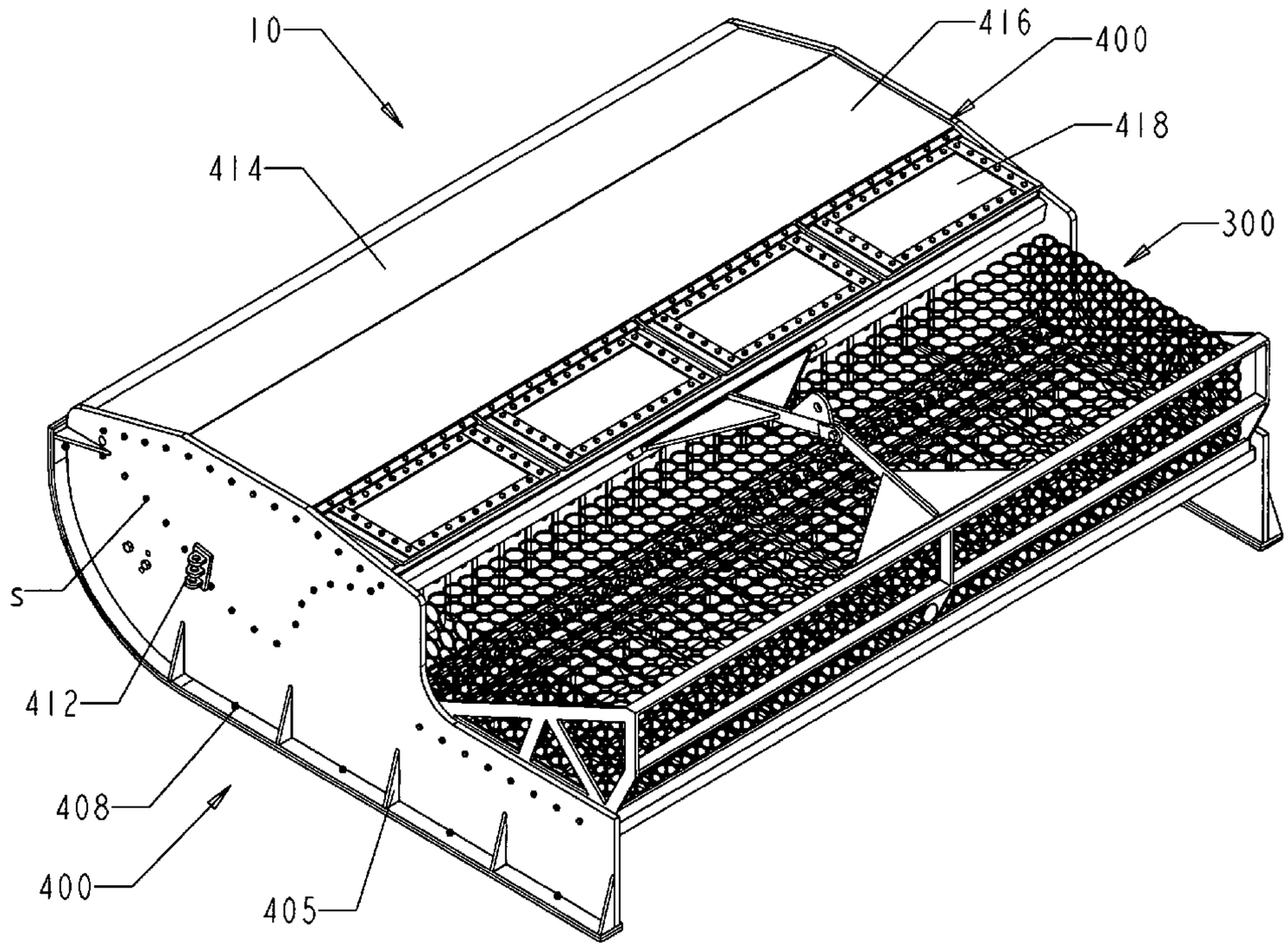
* cited by examiner

Primary Examiner—Thomas A Beach
Assistant Examiner—Matthew R Buck
(74) *Attorney, Agent, or Firm*—Frederick Kaufman

(57) **ABSTRACT**

The assembly comprises a frame-truss subassembly, to which are attached an internal subassembly for directing a flow of encountered water during dragging and a subassembly for collecting and discharging shellfish. An external subassembly is used for encasing the frame-truss subassembly together with the internal subassembly and the subassembly for collecting and discharging shellfish. The frame-truss subassembly includes a pair of lateral trusses, spaced at a distance commensurable with a width of the assembly. The internal subassembly includes an anterior panel with a forwards oriented concavity and a posterior panel with a backwards oriented concavity. The subassembly for collecting and discharging, disposed behind the internal subassembly includes a louver platform, a grid receptacle supported by the platform and a mechanism for topple over the grid receptacle. At least two sets of a multiplicity of hinged flaps are used.

1 Claim, 13 Drawing Sheets



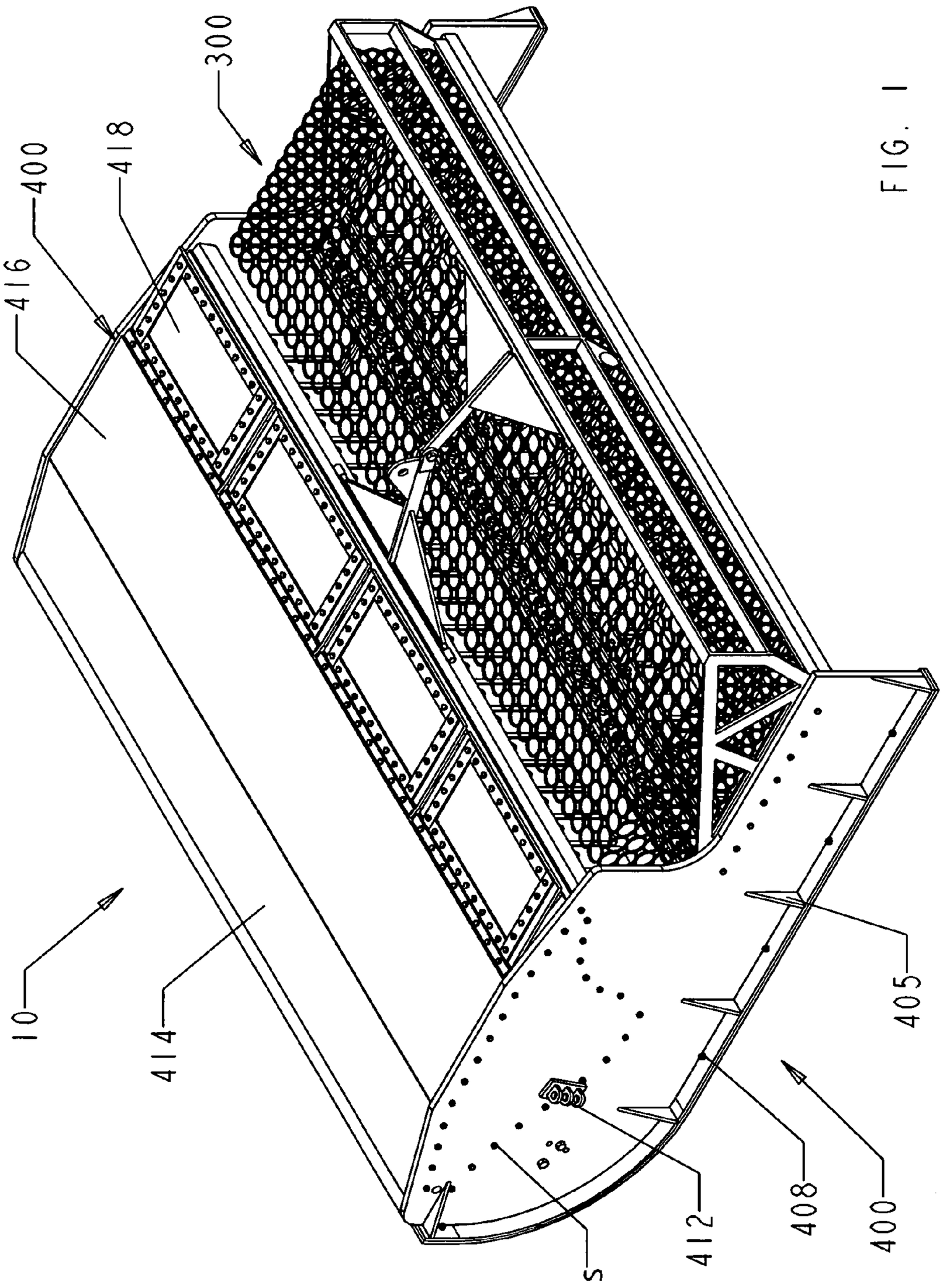


FIG. 1

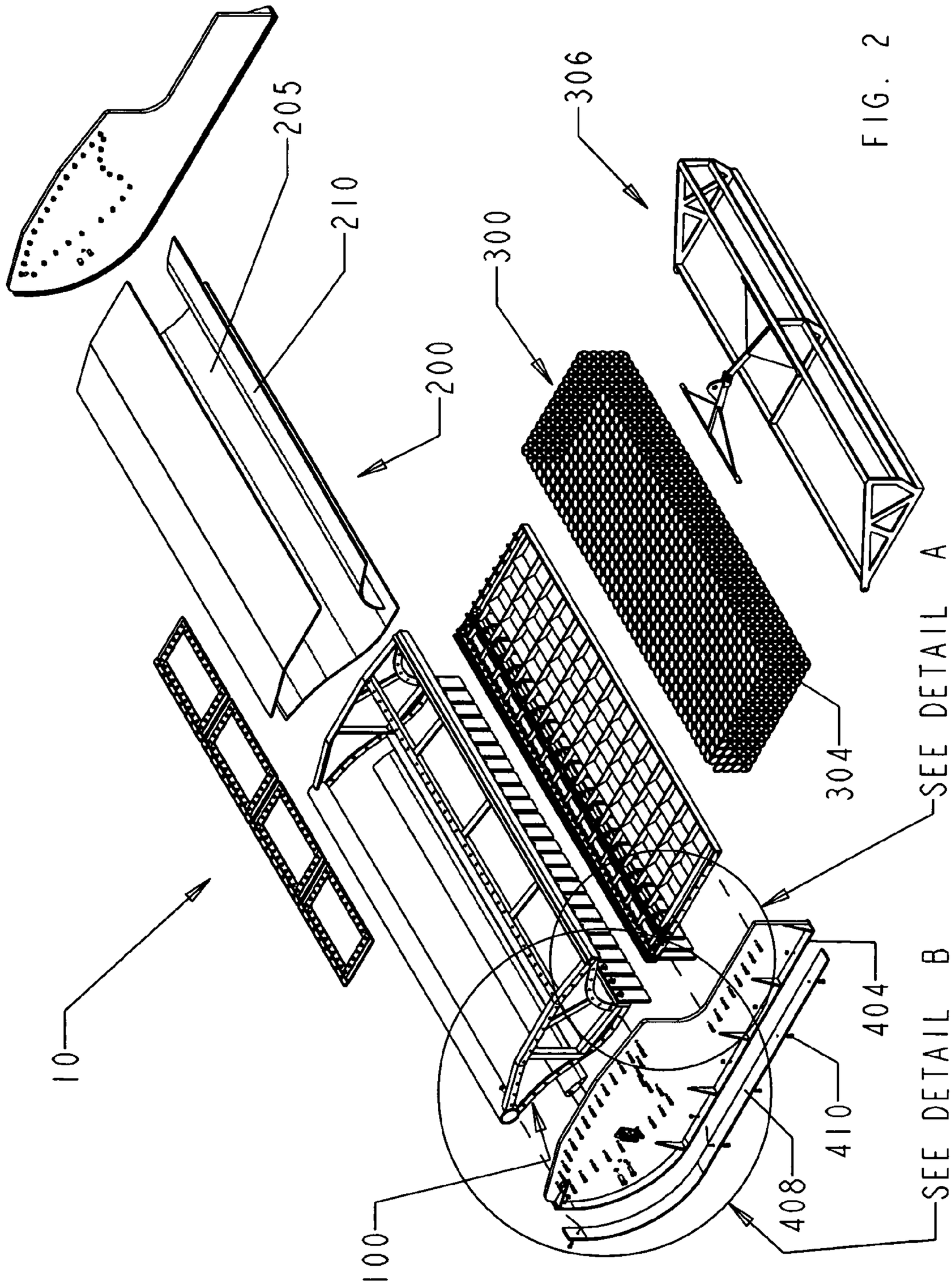

205
210
300
306
200
304
SEE DETAIL A
10
100
404
410
408
SEE DETAIL B

FIG. 2

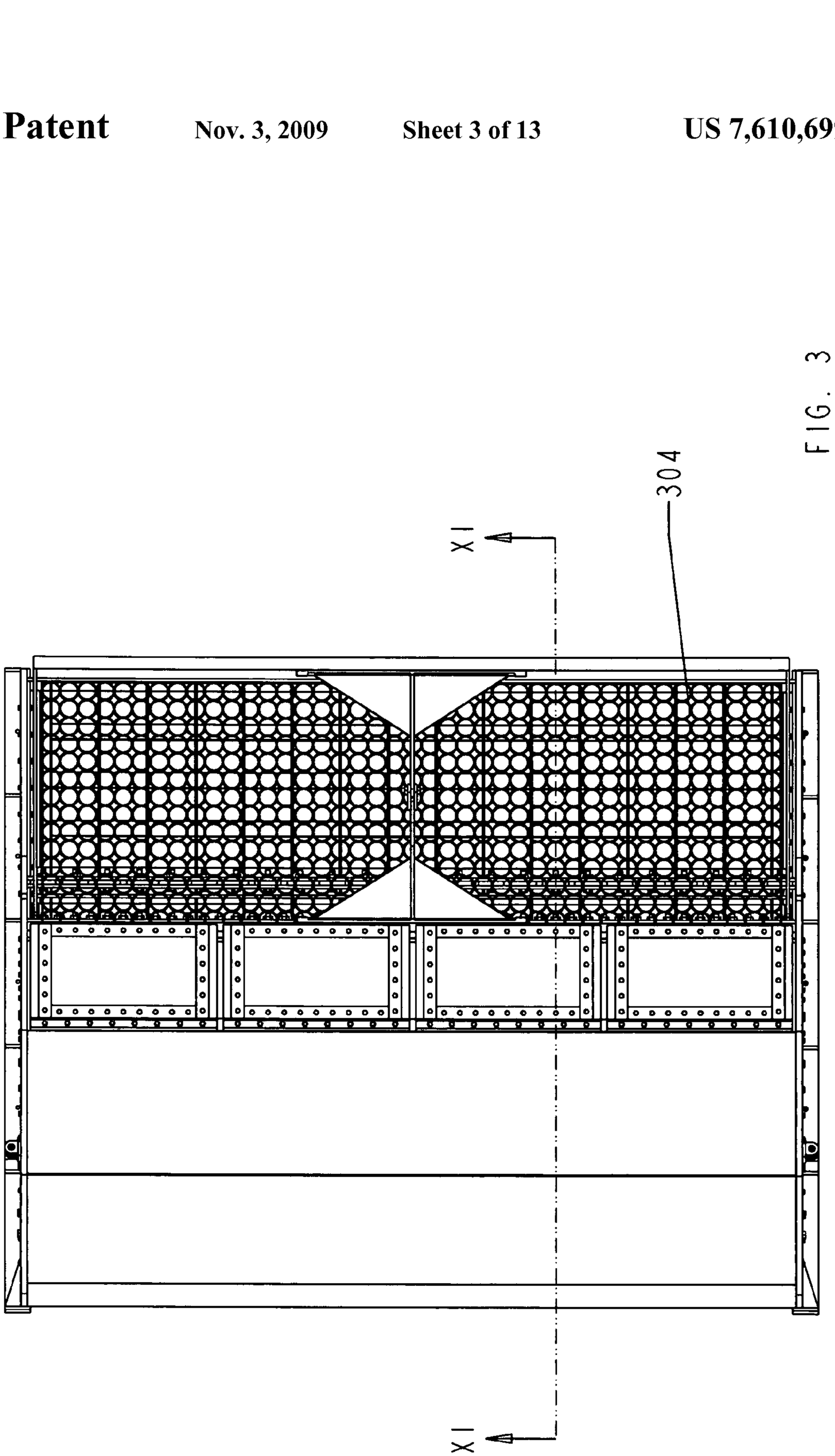


FIG. 3

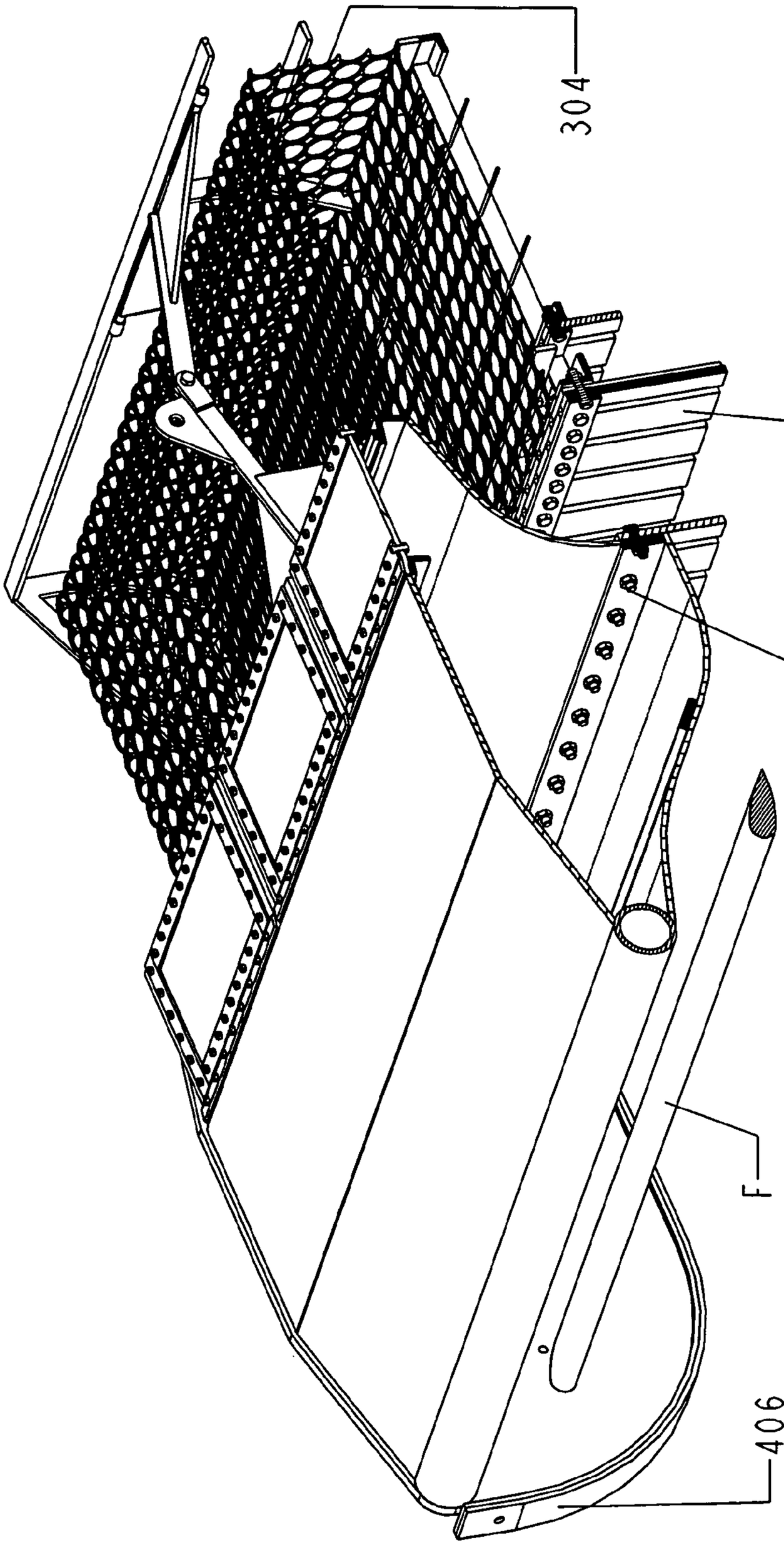


FIG. 4

SECTION XI-XI

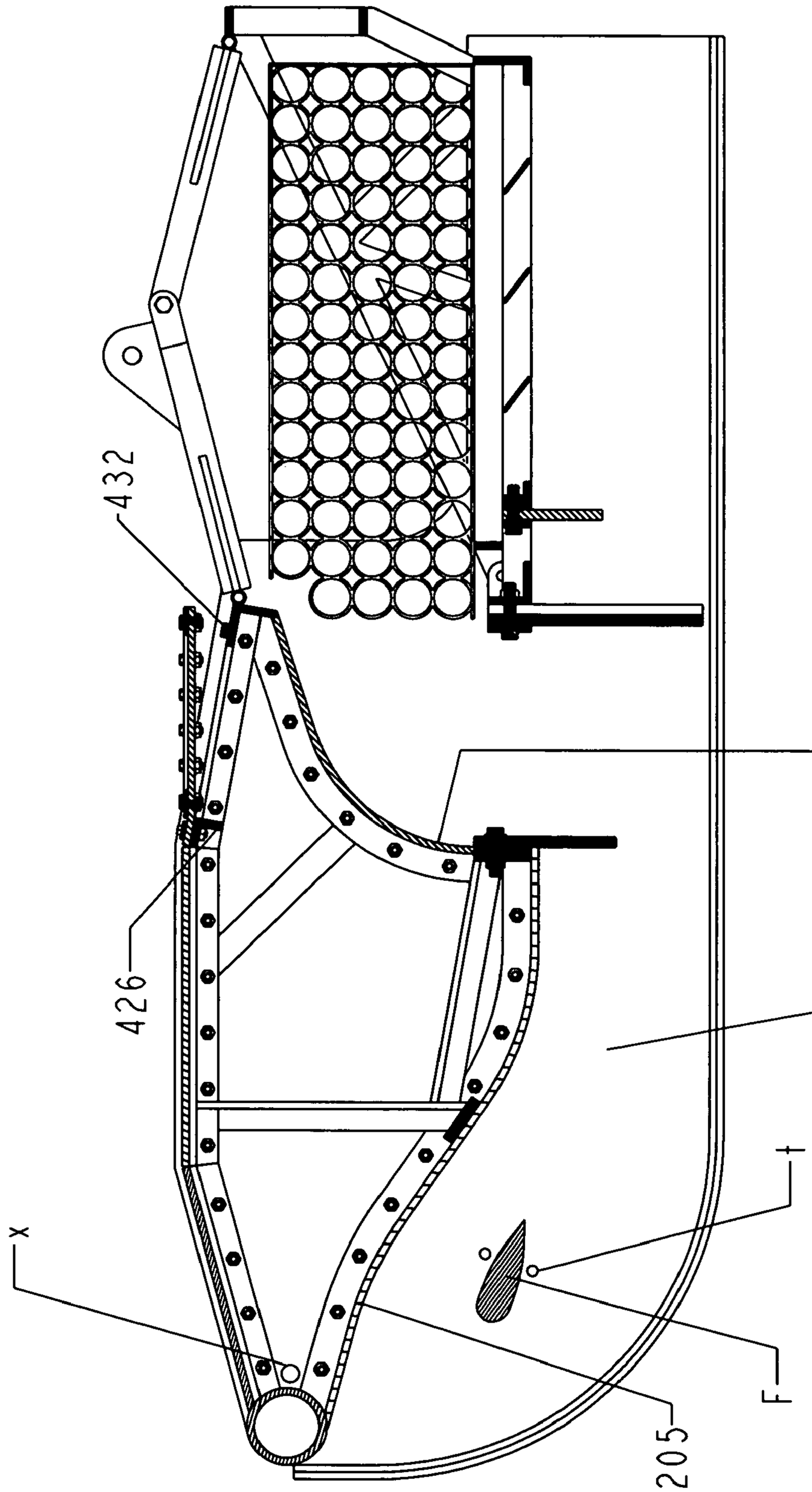


FIG. 5

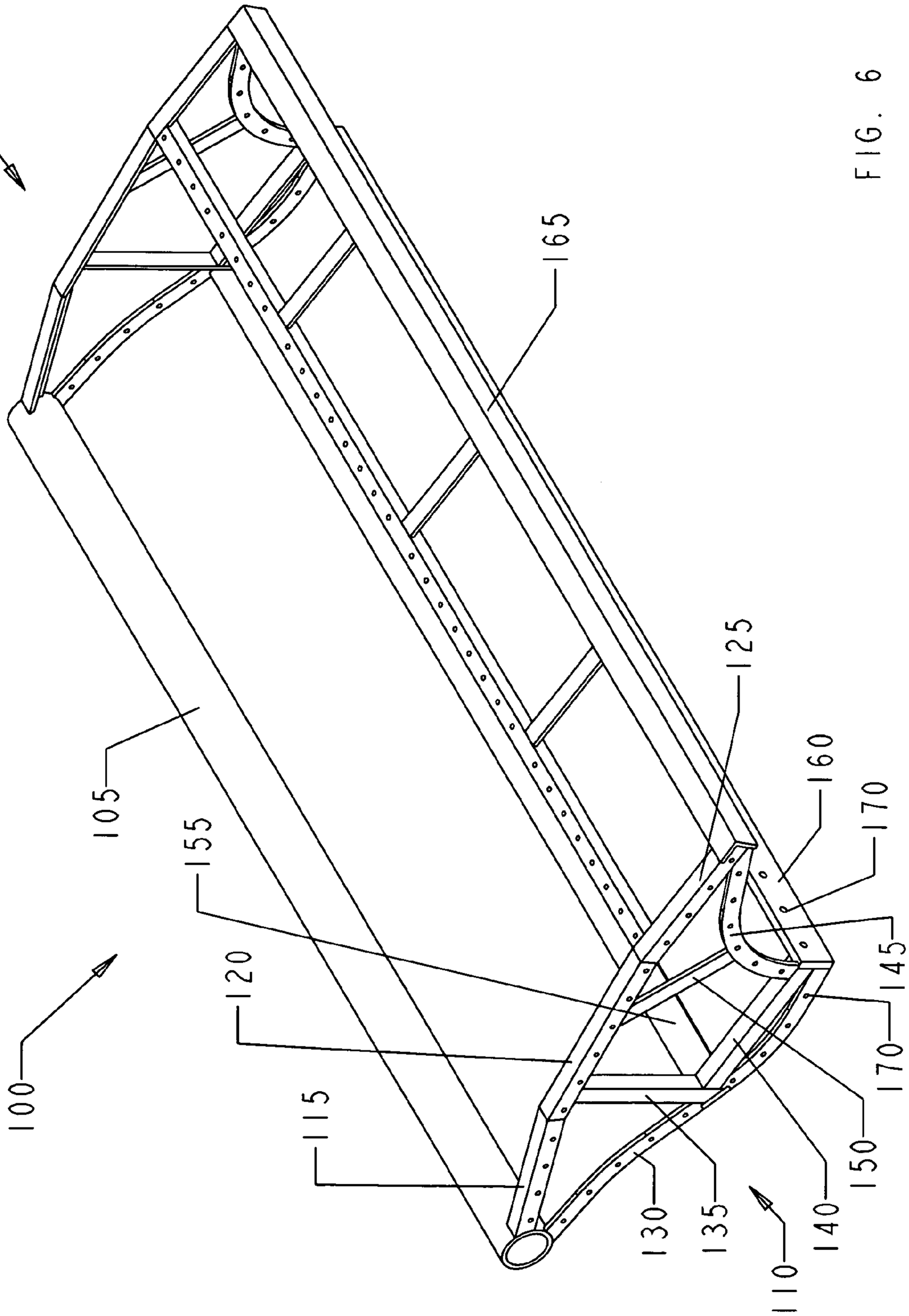


FIG. 6

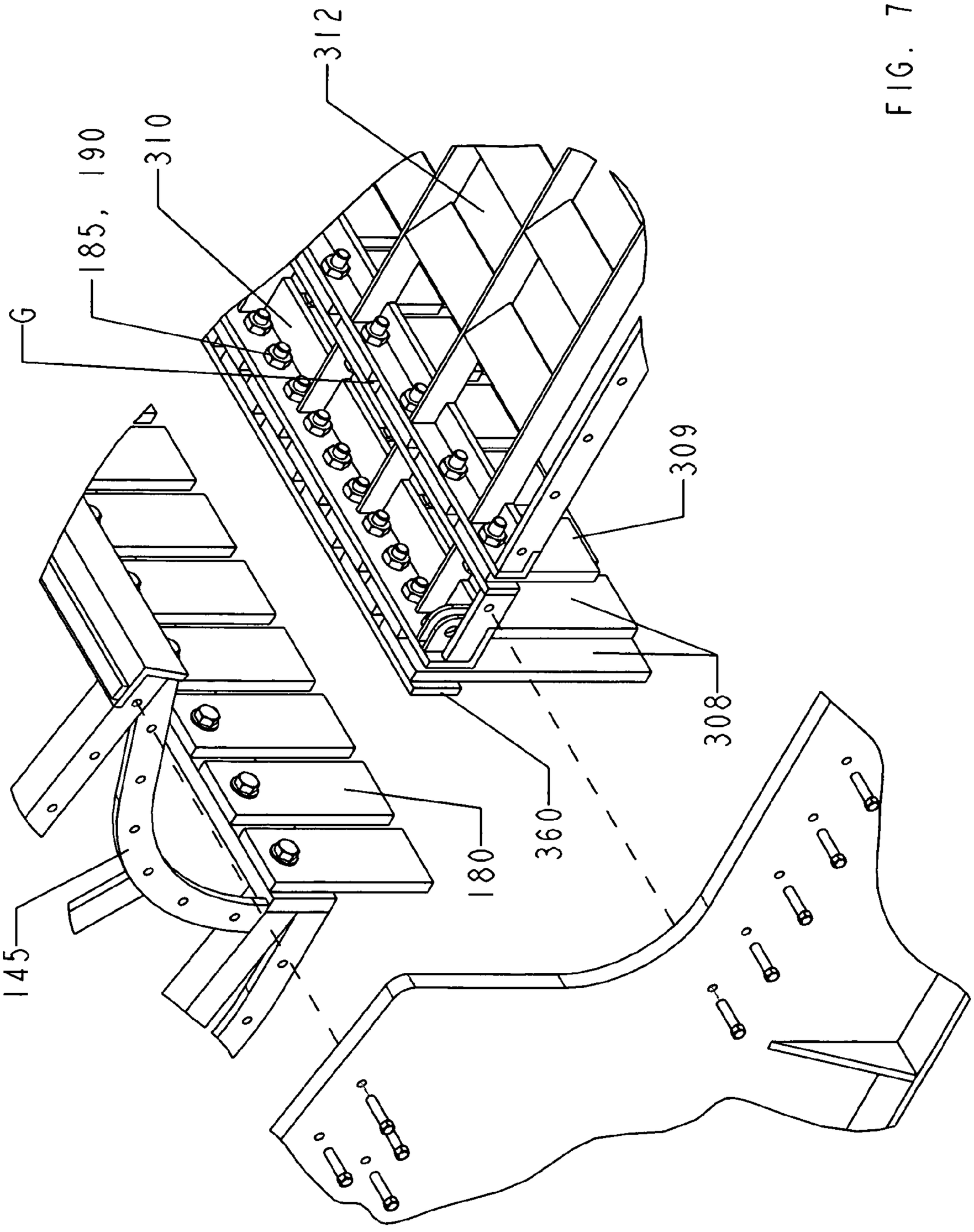


FIG. 7

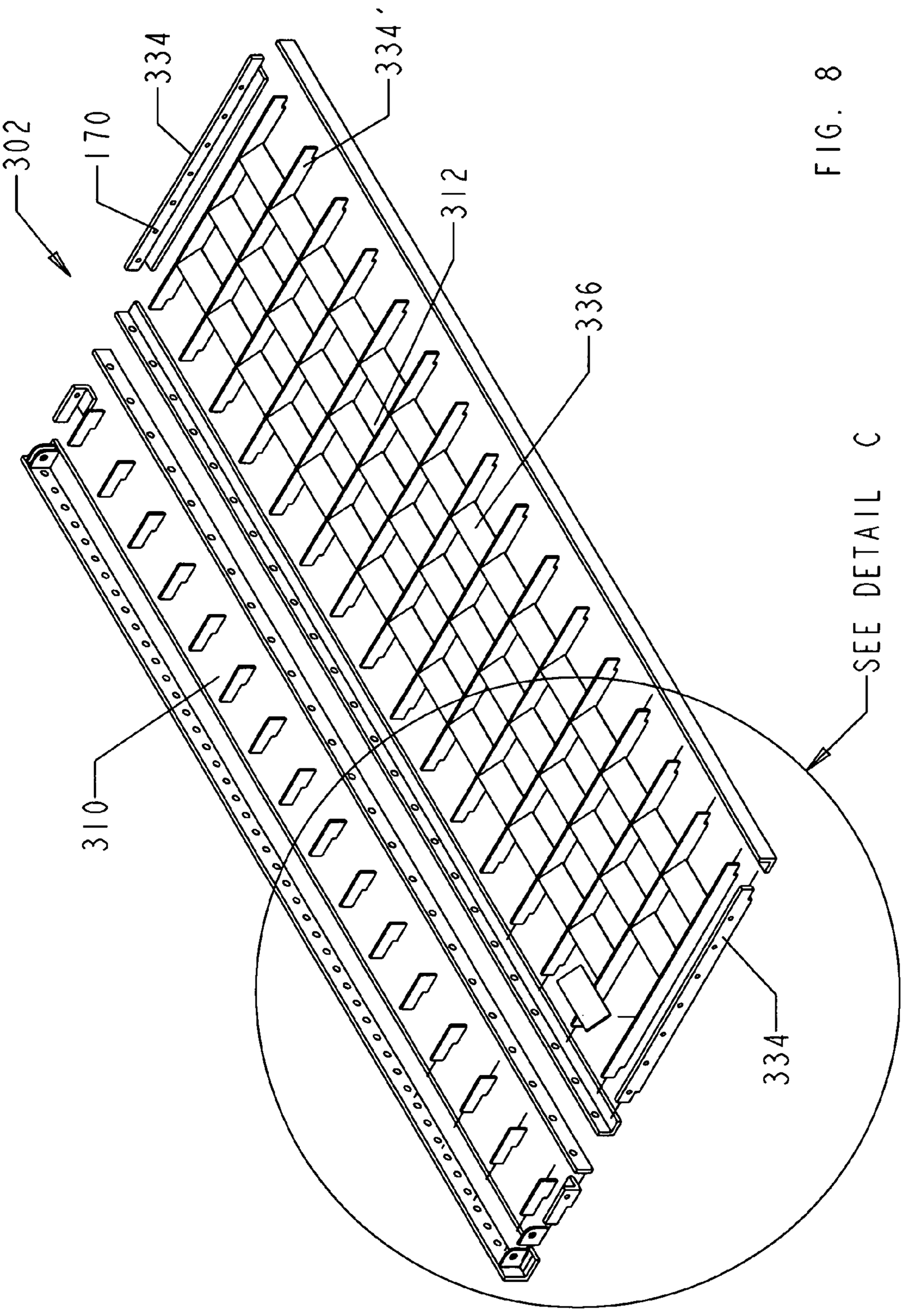


FIG. 8

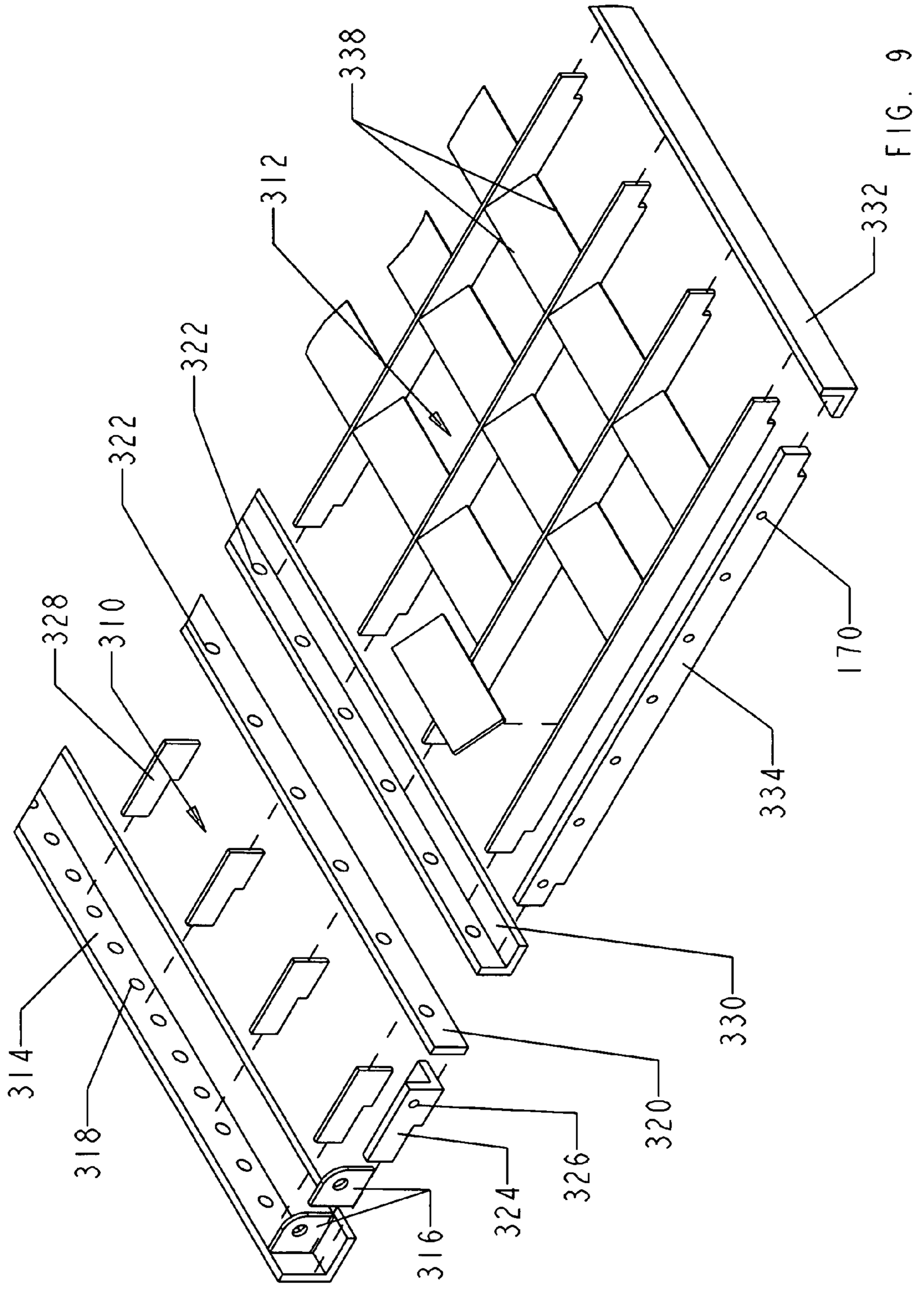


FIG. 9

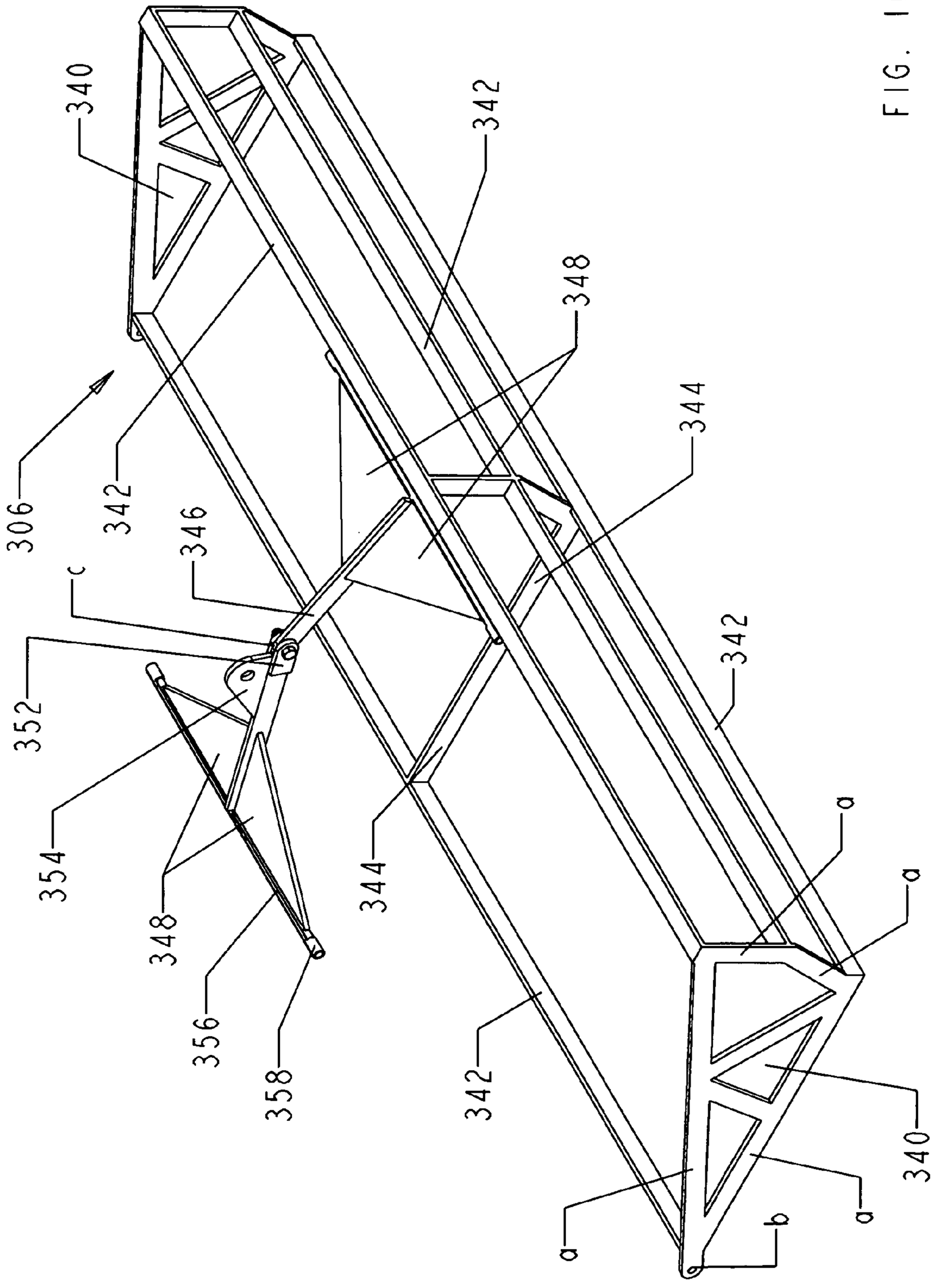

340
342
348
306
342
346
c
352
354
348
356
358
344
342
344
342
a
a
a
342
b
340

FIG. 10

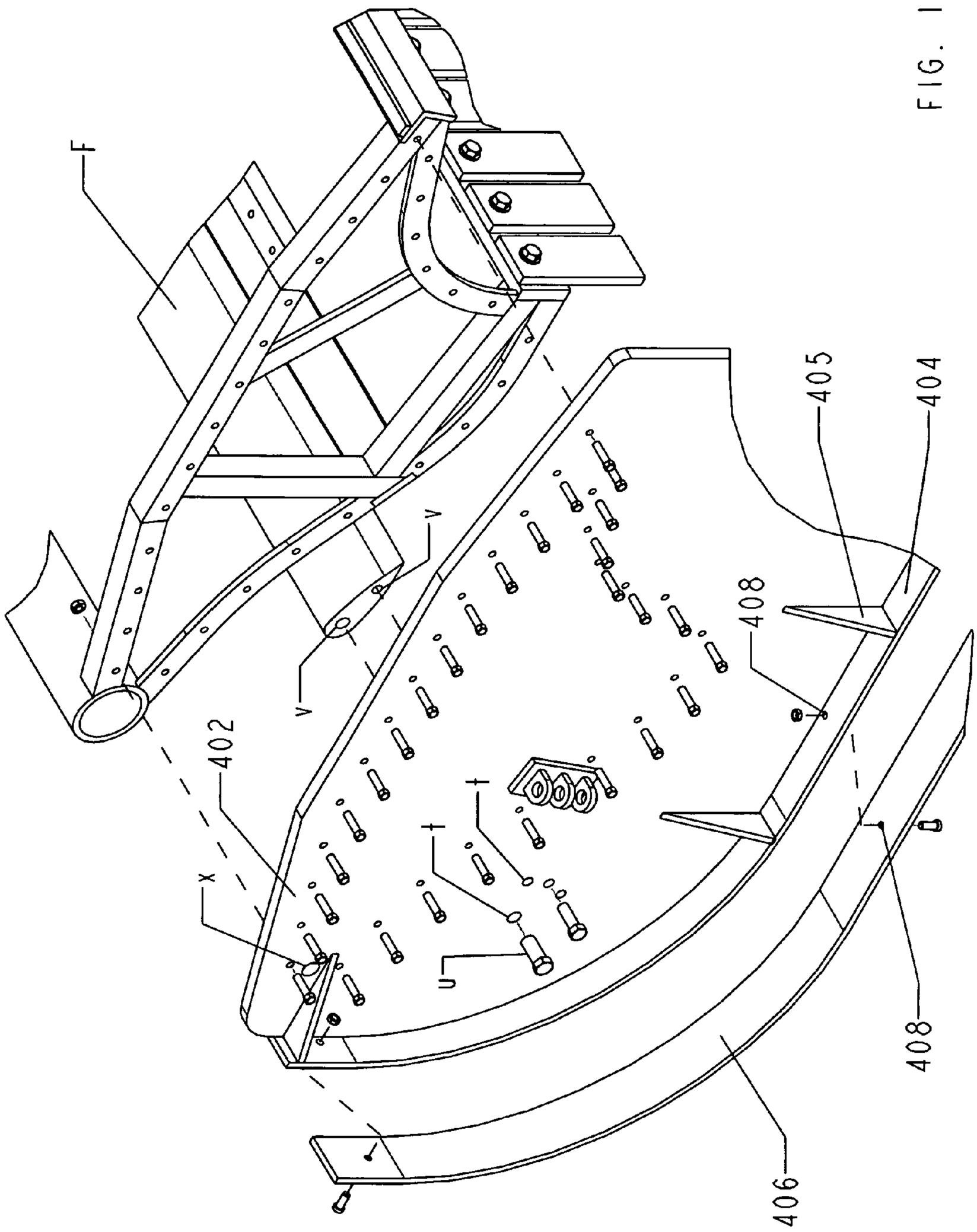


FIG. 11

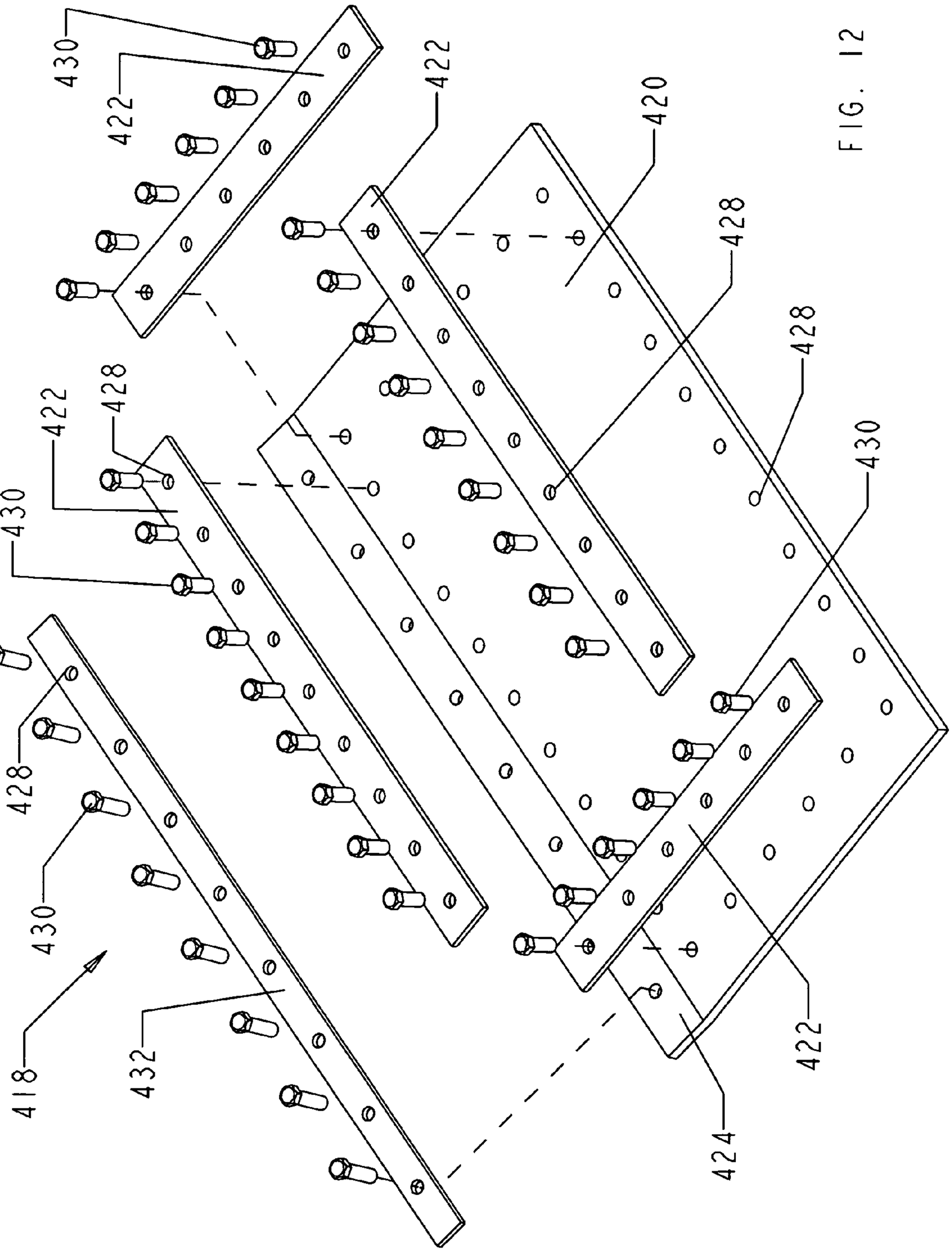


FIG. 12

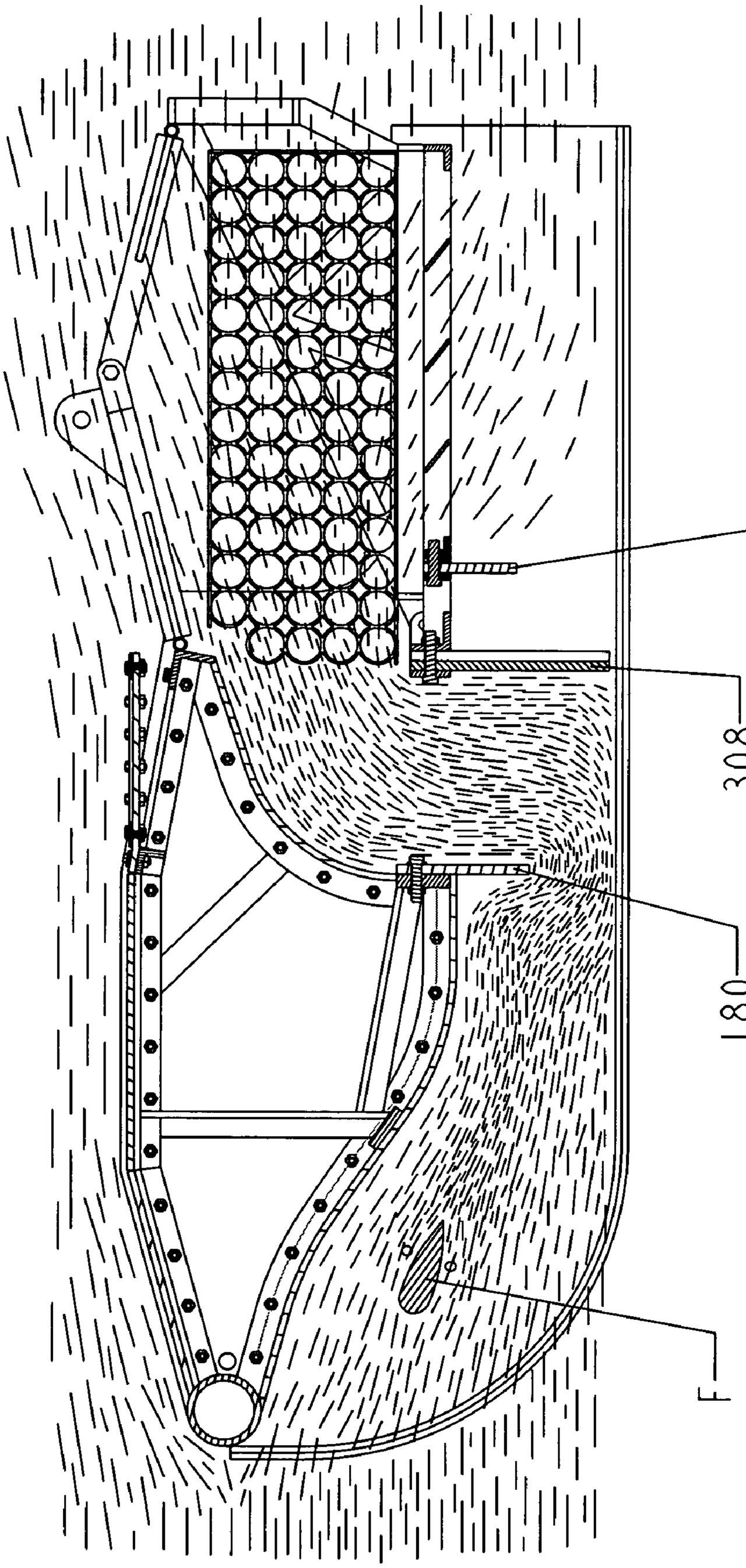


FIG. 13

ASSEMBLY FOR HARVESTING SHELLFISH SUCH AS SCALLOPS AND ALIKE

I. BACKGROUND OF THE INVENTION

1. Definition of the Invention

The present invention refers, in general, to apparatuses for harvesting shellfish and, more particularly, to an assembly for harvesting shellfish such as scallops and alike.

2. Description of the State of Art

As a rule, shellfish living on or in the sea bottom are harvested with the aid of draggers or the like which are dragged along the sea bottom. Such draggers or the like are provided with tines or knives reaching into the bottom, such that the tines or knives are pulled through the sea bottom. A jet of water is directed to the sea bottom, so that the soil of the sea bottom is stirred up and raised. As a result, a quantity of shellfish is disengaged. Behind the tines or the knives, in the dragger, a collecting basket is located in which the shellfish is caught, while mud, sand, sediment, undersized shellfish and the like can flow back through the basket. As a result of the water injection and the direction of the latter, a relatively large mass of sediment is flushed from the bottom. The fact that as a result of on the one hand, the pulling force applied to the dragger and, on the other hand, the force of the water jet directed approximately vertically during the harvesting operation, a buoyant force is applied to the dragger which must be compensated by the weight of the dragger.

Thus, one can conclude, that the known methods of harvesting shellfish suffer the problem of severely disturbing or destroying the shellfish beds. Such destruction of shellfish beds limits the ability of the latter to regenerate themselves, thus reducing the quantity of shellfish available for harvesting in the future.

Various attempts have been made to solve or at least to mitigate the negative aspects of the existing shellfish harvesting. Some attempts can be exemplified in the following prior art references: U.S. Patent Application Publication No. 2006/0037550 to May et al. published Feb. 23, 2006 with the title "Apparatus and method of harvesting shellfish" describes an assembly comprising a boom positioned with one end over the deck of the boat and attached with another end to a turret, and a gathering device. The latter has a rake with a plurality of spaced apart prongs to entrap shellfish. The rake contains also a spray bar with a plurality of spray ports. A hydraulic cylinder is mounted on the boom, while another hydraulic cylinder is mounted to a gathering arm. The foregoing apparatus has several important disadvantages, among which are: the depth of harvesting is limited by the length of the gathering arm and the use of hydraulic cylinders renders the apparatus relatively expensive and less reliable. Another example is: U.S. Pat. No. 5,027,533 to Holt et al. issued Jul. 2, 1991 for a "Vibratory shellfish harvesters and methods". Basically, a Holt's harvester includes a sledge having a pair of runners designated to slide over the submarine surface of a shellfish growing substrate and a plurality of tines extending downward from the sledge for penetration into the substrate. A vibratory device is used to impart a vibratory motion to those tines, in a substantially normal direction to to the submarine surface. The vibratory device includes a rotatable, off-center mass and a hydraulic motor for rotating the mass; a shock absorber device is used to reduce vibration of the runners by the vibratory device. The solution described in this patent is an example of substrate disturbance by the plurality of tines. Moreover, the use of a vibratory device negatively affects the submarine interface between bottom sediment and the water just above it, which is a very important region of submarine water.

II. SUMMARY OF THE INVENTION

Based on the above presentation, it will become apparent that the forthcoming objectives of the present invention are not accomplished by presently available apparatuses.

Accordingly, a basic objective of the present invention is to design an assembly which minimize undesirable habitat damage by reducing the disruption of the beds in which remaining shellfish continue to grow.

Another important objective is to obtain dynamic fluid forces able to extract shellfish and divert it into a subassembly for collecting and discharging.

Broadly stating the assembly for harvesting shellfish such as scallops and alike, according to the present invention, comprises

a frame-enclosure truss subassembly to which are attached

an internal subassembly for directing a flow of encountered water during a dragging

operation of the assembly for harvesting shellfish;

a subassembly for collecting and discharging harvested shellfish; and an external subassembly for encasing the frame-enclosure truss subassembly together with

the internal subassembly for directing a flow of encounter water during a dragging.

The frame-enclosure truss subassembly includes a pair of lateral trusses extending longitudinally and spaced at a distance commensurable with a working width of the assembly for harvesting shellfish.

The internal subassembly for directing a flow of encountered water during a dragging operation includes an anterior, curved panel having its concavity forwards oriented and a posterior, curved panel having its concavity backwards oriented. The anterior and posterior curved panels are flanked by the pair of lateral trusses.

The subassembly for collecting and discharging harvested shellfish, disposed behind the internal subassembly for directing a flow of encountered water during a dragging operation, includes a louver type grille-platform, a metal grid receptacle supported by the louver type grille-platform and a mechanism for topple over the metal grid receptacle when loaded with shellfish.

At least a pair of sets of a multiplicity of hinged flexible flaps is used, a first, front one being attached to a lowest part of the internal subassembly for directing a flow of encountered water during a dragging operation, where the anterior and posterior curved panels meet, while a second multiplicity of hinged flexible flaps is attached at a frontal part of the louver type grille-platform.

III. BRIEF DESCRIPTION OF THE DRAWINGS

Although the characteristic features of the invention will be particularly pointed out in the claims, the invention itself and the manner in which it may be made and used may be better understood by referring to the following description and accompanying drawings, where like reference numerals refer to like parts throughout the several views of the drawings, in which:

FIG. **1** is a perspective view of the assembly for harvesting shellfish such as scallops and alike;

FIG. **2** shows an exploded view of the assembly depicted in FIG. **1**;

FIG. **3** is a top plan view of the assembly depicted in FIG. **1**;

FIG. **4** is a longitudinal cross section taken along line X**1**-X**1**, depicted in perspective, of FIG. **3**;

FIG. **5** is a longitudinal cross section taken along line X1-X1 of FIG. **3**;

FIG. **6** is a perspective view of a frame-enclosure truss subassembly;

FIG. **7** is an enlarged fragmentary perspective view of "DETAIL A" depicted in FIG. **2**;

FIG. **8** is an exploded view of a louver type grille-platform according to the present invention;

FIG. **9** is an enlarged fragmentary view of "DETAIL C" depicted in FIG. **8**;

FIG. **10** is a perspective view of a mechanism for topple over a loaded metal grid receptacle;

FIG. **11** is an enlarged fragmentary view of "DETAIL B" depicted in FIG. **2**;

FIG. **12** is an exploded view of a flat panel; and

FIG. **13** is a longitudinal cross section as shown in FIG. **5**, wherein the flow of water and shellfish is diagrammatically shown.

IV. DESCRIPTION OF THE PREFERRED EMBODIMENT

The accompanying drawings, as above described, illustrate a preferred embodiment of an assembly for harvesting shellfish such as scallops and alike, generally referenced as **10**. For convenience, in the following disclosure, the foregoing assembly will be named "assembly **10**". As a caveat, it is to be agreed, that terms, such as "top", "bottom", "front", "back", "vertical", "horizontal", "upward", "downward" and "outward" are conventionally employed in the present specification with reference to the normal position in which assembly **10** will be used.

Broadly describing, with reference to FIGS. **1** through **5**, assembly **10** comprises a frame-enclosure truss subassembly **100**, to which are attached other subassemblies which compose assembly **10**, namely:

- an internal subassembly **200** for directing a flow of encountered water during a dragging of assembly **10**, when the latter is immersed; and
- a subassembly **300** for collecting and discharging harvested shellfish; and
- an external subassembly **400** for encasing frame-enclosure truss subassembly **100** together with internal subassembly **200** and subassembly **300** for collecting and discharging harvested shellfish.

Describing now in detail, frame-enclosure truss subassembly **100** (see FIG. **6**), which is a space truss of welding design, includes:

- a tubular member **105** frontally located and transversally extending with respect to assembly **10**; tubular member **105** has a length generally commensurable with a working width of the aforementioned assembly **10**;
- a pair of lateral trusses **110** extending backward from tubular member **105**, namely from longitudinal extremities of the latter; each lateral truss **110** is made of standard L-section beams and incorporates an inclined upper truss member **115** starting from tubular member **105**, to which it is permanently secured, and extending upwardly; an intermediary upper truss member **120** forms a butt joint with inclined upper truss member **115** and extends backward, slightly deviating upwardly from the horizontal direction; an upper end truss member **125**, which after forming a butt joint with intermediary upper truss member **120** extends backward, slightly deviating downwardly from the horizontal direction;

each lateral truss **110** further incorporates a lower truss member **130**, characterized by a contour similar to a longitudinally stretched S, which starts from tubular member **105**, to which it is permanently secured, and extends backward and downwards; lower truss member **130** has a length, when projected on a horizontal plane, generally similar to compounded lengths, when projected on a horizontal plane, of inclined upper truss member **115** and intermediary upper truss member **120**;

each lateral truss **110** yet further includes: a) a vertical strut **135** which starts from intermediary upper truss member **120**, more precisely, starts in proximity of the zone where intermediary upper truss member **120** forms a butt joint with inclined upper truss member **115**, and joins lower truss member **130**; b) an inclined strut **140** which extends from a bottom of vertical strut **135** and ends, after contacting an upper end of lower truss member **130**, in a vertical imaginary plan which passes through an end surface of lower truss member **130**; and c) a connecting truss member **145** which joins a lower terminal zone of upper end truss member **125** and an upper terminal zone of lower truss member **130**;

connecting truss member **145** has a profile similar to an arc of a circle subtending an angle somewhat more than 90°; a top segment of connecting truss member **145** departs upwards from its normal circular contour;

finally, each lateral truss **110** is also provided with a diagonal type strut **150** which generally joins a middle zone of intermediary upper truss member **120** with a middle zone of connecting truss member **145**;

in order to secure a spatial rigidity of frame-enclosure truss subassembly **100**, the pair of lateral trusses **110** are interconnected as follows:

by 1) aforementioned tubular member **105**;

2) a first flat bar **155** so joining the underneaths of vertical struts **135** as to coincide with a segment of a lower external contour of lower truss member **130**;

3) a second flat bar **160** joining inclined strut **140** with lower truss member **130** in a zone where inclined strut **140**, after contacting an upper end of lower truss member **130**, ends in a vertical imaginary plane which passes through an end surface of lower truss member **130**;

4) an inversed L-beam **165** which captures and joins connecting truss member **145**, respectively its upper part, and lower terminal zone of upper end truss member **125**, where the former and the latter form a junction.

Inclined upper truss member **115**, intermediary upper truss member **120**, upper end truss member **125**, lower truss member **130** and connecting truss member **145**, all made of standard L-section beams, have all their laterally oriented legs traversed along their length by a plurality of equally spaced apertures **170** whose use will be described further in this disclosure; second flat bar **160** is longitudinally provided with equally spaced openings **175** and their use will be explained in the forthcoming disclosure.

A first set of a multiplicity of hinged flexible flaps **180**, made of rubber or equivalent materials, is secured along second flat bar **160** via conventional fasteners such as bolts **185** inserted into equally spaced openings **175** and tightened by nuts **190**.

Internal subassembly **200** includes basically an anterior, curved panel **205** with its concavity forwards oriented, followed by a posterior, curved panel **210** with its concavity backwards oriented.

Anterior, curved panel **205** starts from tubular member **105** to which it is secured, then extends downwards and backwards, being continuously superimposed on and secured to:

lower truss member **130**, respectively its lower external surface;

bottom of first flat bar **155**; and

bottom of second flat bar **160**.

Posterior, curved panel **210** is so profiled as to coincide with connecting truss member **145**, on which is superposed and to which is attached.

Subassembly **300** adapted for collecting and discharging harvested shellfish, such as scallop and alike includes:

A) a louver type grille-platform **302**;

B) a metal grid receptacle **304** supported by louver type grille-platform **302**;

C) a mechanism for topple over **306** a loaded metal grid receptacle **304**; and

D) a second and a third set of a multiplicity of hinged flexible flaps, respectively **308** and **309**, secured to louver type grille-platform **302**.

Louver type grille-platform **302** (see FIGS. **8** and **9**) is spaced behind a lower part of curved panel **210** and incorporates a first grille section **310**, followed by a second grille section **312**, both being horizontally positioned and having the same width, generally commensurate with the working width of assembly **10**. A gap G is provided between first and second grille sections **310** and **312**.

First grille section **310** comprises a frontal L-section beam **314** provided at each end with a pair of hinge brackets **316** having coincidental eyelets. Frontal L-section beam **314** is traversed along its length by a series of bolt-holes **318**.

A strip **320** is placed oppositely frontal L-section beam **314** and spaced at a relatively small distance from the latter. The former is traversed along its length by a plurality of bolt-openings **322**. Frontal L-section beam **314** and strip **320** are rigidly secured together, at their ends, in order to form a rectangular frame, by a pair of L- section segments **324**.

Each L-section segment **324** has a cut-out for adjusting to frontal L-section beam and also a lateral perforation **326**. A plurality of vertical spacers **328** is placed at equal intervals between frontal L-section beam **314** and strip **320**.

Second grille section **312**, as viewed in plan, has also a rectangular shape and includes an anterior L-section beam **330** and a posterior inversed L-section beam **332**, the latter, positionally, constituting a mirror image of the former. Anterior L-section beam **330** is traversed along its length by a plurality of bolt-openings **332** coincidental with those of strip **320**.

A pair of elongated flat plates **334**, each provided at each end with a cut-out for engaging an adjacent leg at the extremities of anterior L-section beam **330** and posterior inversed L-section beam **332**, is used. Each elongated flat plate **334** of the aforementioned pair is provided along its length with a plurality of equally spaced apertures **170**, similar with those used in the pair of lateral trusses **110**.

Several elongated flat plates **334'**, distinguishable from the pair of elongated flat plates **334** only by the fact that the plurality of equally spaced apertures **170** is missing, are placed parallel to the pair of elongated flat plates **334** and equally spaced among themselves. Several sloping boards **336**, located in the same plan with the several elongated flat plates **334'**, are perpendicularly disposed relatively to the later, and form together a series of chutes **338**.

Metal grid receptacle **304** is parallelepiped-shaped, made of grading screen, and open only in the front. It is obvious, that metal grid receptacle **304** can be changed for another screen having a different mesh size to suit specific species of the selfish to be harvested.

Mechanism for topple over **306** comprises a pair of polygonal structures **340**, laterally and vertically located as to sidewise engage metal grid receptacle **304**. Each polygonal structure **340** has four sides a. A pair of sides a converge and intersect frontally forming an acute angle, an opposed pair of sides a define an obtuse angle, while the remaining angles are right angles. Each zone of convergence of a pair of sides a corresponding to the acute angle is provided with a hole b. Four transversal elongated bars **342** connect between them the pair polygonal structures **340**, namely between each intersection of a pair of sides a.

Starting from a bottom of each polygonal structure **340**, three rigidity bars **344** are used to secure, at their midway, two successive transversal elongated bars **342**. Transversal elongate bar **342**, adjacent hole b is somewhat backwards retracted from an apex of the intersection of the corresponding pair of sides a. Rigidity bar **344** that is located at the bottom of polygonal structure will always be placed beneath metal grid receptacle **304** A first tilt lever **346**, disposed in a vertical plan and inclined with respect to a horizontal plan, is attached at the middle of an upper transversal elongated bar **342**. To enhance the reliability of the attachment of the former with respect to the latter from both sides, a pair of side reinforcing gussets **348** is used. First tilt lever **346** is provided, at its front side, with an opening c. A second tilt lever **350**, forwards directed, follows first tilt lever **346**. Second tilt lever **350** includes at its back end a double-bracket hinge **352** traversed by an opening c. Double-bracket hinge **352** receives front side of first tilt lever **346** and a conventional pin is used to articulate first and second tilt levers **346** and **350**. A hooking bracket **354** used for lifting is secured at the upper back end of second tilt lever **350**. A rod **356** is perpendicularly attached at that end of second tilt lever **350** that is opposite located with respect to double-bracket hinge **352**. Each end of rod **356** is, by insertion, lodged as a bearing journal into a sleeve **358**. Both sleeves are secured to inversed L-beam **165** incorporated in frame-enclosure truss subassembly **100**. To enhance the reliability of an attachment of a front end of second tilt lever **350** to rod **356**, a pair of side reinforcing gussets **348** is used.

Second set of a multiplicity of hinged flexible flaps, see reference number **308**, is formed as a succession of longitudinally overlapping flaps that extend downwardly closer to the seabed (in comparison with first set of a multiplicity of hinged flexible flaps **180**). A front strap **360** provided with a series of holes coincidental with the series of bolt-holes **318** of frontal L-section beam **314** and a corresponding multiplicity of conventional fasteners, such as bolts **185** inserted into equally spaced bolt-holes **318** and tightened by nuts **190**. Third set of a multiplicity of hinged flexible flaps (an optional set intended for large rocky bottoms), see reference number **309**, is inserted into gap G formed between strip **320** of first grille section **310** and anterior L-section beam **330** of second grille section **312**. Since anterior L-section beam **330** is traversed along its length by a plurality of bolt-openings **332** coincidental with those of strip **320**, for attaching the multiplicity of hinged flexible flaps, use is made of bolts **185** and nuts **190** as in previous flaps attachments. Third set of a multiplicity of hinged flexible flaps **309** is relatively shorter than first set of a multiplicity of hinged flexible flaps **180**.

External subassembly **400** for encasing frame-enclosure truss subassembly **100** together with internal subassembly **200**, and, as well, subassembly **300** for collecting and discharging harvested shellfish, comprises:

A pair of vertical, sturdy, lateral walls **402** extending longitudinally for flanking encasing frame-enclosure truss subassembly **100** and the other subassembly attached to it. A foil F is also flanked by the pair of vertical, sturdy, lateral walls **402**, being located transversally to the latter, and generally, corresponding to a center of a cavity formed in the front of internal subassembly **200**.

At its uppermost part, each vertical, sturdy, lateral wall **402** is defined by an upper periphery, which, basically, reproduce a continuous corresponding successively to a top of inclined upper truss member **115** starting from tubular member **105**, to a top of intermediary upper truss member, to a a top of upper end truss member **125**, and, then, after abruptly descending, to a top of L-section segment **324** and, finally, to a top of elongated flat plate **334**.

A lower contour of each vertical, sturdy, lateral wall **402** starts from tubular member **105** and continues with a curvilinear descent that forms, as seen from outside, a convex shape, to change into a horizontal line extending up to an end of assembly **10**.

A sole **404**, made from a flat bar, is secured to a bottom of and outwardly from each vertical, sturdy, lateral wall **402**, namely through the length of its lower contour. Several spaced stiffeners **405** are used to enhance a reliability of the joint between each vertical, sturdy, lateral wall **402** and sole **404**. A runner **406** having a profile reproducing sole **404** is removably attachable to the latter. Sole **404** and runner **406** are each provided with coinciding openings **408** which via bolt-nut connections **410** allow their attachment. There is a distance between a lowest point of anterior, curved panel **205** of internal subassembly **200** and a bottom of each runner **406** which touches the submarine surface. In a space created by that distance extend downwardly first, second and third sets of multiple hinged, flexible flaps, respectively **180**, **308** and **309**.

A unit of several eyelet hooks **412** for dragging and lifting is firmly secured laterally to an external surface of each vertical, sturdy, lateral wall **402**.

Each of the latter is traversed by a number of perforations as follows:

perforation s for lateral truss **110** attachment; perforations s being coaxial with the plurality of equally spaced apertures **170** drilled into inclined upper truss member **115**, intermediary upper truss member **120**, upper end truss member **125**, lower truss member **130**, connecting truss member **145**, and elongated flat plate **334**; a perforation s is also compatible with lateral perforation **326** in L-section **324**;

perforations t for locating and positionally adjusting foil F; one perforation t for locating foil F and three perforations t spaced backwards and disposed on an arc of a circle; and a pair of screws u for passing through two of the foregoing four apertures t and for tightening in threaded blind holes v provided at each lateral extremity of foil F; and

a discharge perforation x for air escape from a space in front of anterior, curved panel **205**.

An inclined top panel **414** starting from tubular member **105** extends backwards along and over a pair of inclined upper truss member **115**. Inclined top panel **414** is secured to the pair of inclined upper truss members **115**. An intermediary top panel **416** starting from a back end of inclined top panel **414** extends also backwards along and over a pair of intermediary upper truss members **120**. Intermediary top panel **416** is secured to the pair of intermediary upper truss members **120**.

A flap panel **418** (set of 4) starting from an end of inclined top panel **414** extends, in general, backwards, along and over a pair of upper end truss members **125**. Flap panel **418** has a rectangular shape and includes a plate **420** reinforced along its sides by straps **422**. A front transversal edge **424** of plate **420** extends forwards beyond its adjacent strap **422** to lay on a L-section deformable beam **426** secured at a beginning of the pair of upper end truss members **125**. Plate **420** and straps **422** are provided with corresponding orifices **428** and bolt-screw combinations **430** for joining together.

An extra strap **432** is superimposed on front transversal edge **424**. The former and the latter are also provided with corresponding orifices **428** and bolt-screw combinations **430** for joining together.

A deformable strap **432** is attached on top of inversed L-beam **165** and is intended to alleviate impacts from an opposed posterior part of flap panel **418** when the latter is brusquely closing.

OPERATION

The present assembly **10** is attached by a cable to a floating vessel and dragged over the sea bottom. A hoisting mechanism (not shown), operating the cable, is attached to the floating vessel and is used to lower assembly **10** on the sea bottom before any dragging operation starts and to lift assembly **10** out of the water at an end of each harvesting operation. The unit of several eyelet hooks **412** for dragging and lifting is firmly secured laterally to an external surface of each vertical, sturdy, lateral wall **402** and is attachable by cable to the hoisting mechanism atached to the floating vessel.

Foil F, whose structure and attachment were disclosed before, provides a surface designated to maximize a force generated perpendicular to the water flow, i.e. a "lift", while minimizing the resistance under the water due to a friction of runners with the sea bed, i.e. a "drag". Foil F is provided with means for adjusting its attack angle by tilting in a fixed position. An explanation of the foil use is that the water flowing over foil F achieves a higher velocity and a corresponding lower pressure than the water flowing under foil F resulting in an upward force/lift/; however, due this pressure differential, the water near foil F tip tends to flow from beneath foil F to above the latter. This "leakage" around the tip forms foil tip vortices. When the upper and lower water flows meet at the trailing edge of foil F numerous little vortices are formed and, then, unite to form a large vortex (at the tip of foil F).

This large vortex creates a spiral motion of water within a limited area, namely a whirling mass of water that sucks everything near it towards its center. Here intervenes internal subassembly **200** with its anterior, curved panel **205** followed by posterior, curved panel **210**. Thus, water containing shellfish is carried away and then directed into metal grid receptacle **304** via its open front. Now the water can flow out of metal grid receptacle **304**, while shellfish is captured therein.

What I claim is:

1. An assembly for harvesting shellfish such as scallops and alike comprising

a frame-enclosure truss subassembly to which are attached internal means for directing a flow of encountered water during a dragging operation of said assembly for harvesting shellfish;

means for collecting and discharging harvested shellfish; and

external means for encasing said frame-enclosure truss subassembly together with said internal means for directing a flow of encounter water during dragging;

said frame-enclosure truss subassembly including a pair of lateral trusses extending longitudinally and spaced at a distance commensurable with a working width of said assembly for harvesting shellfish;

said internal means for directing a flow of encountered water during a dragging operation including an anterior, curved panel having its concavity forwards oriented and a posterior, curved panel having its concavity backwards oriented, said anterior and posterior curved panels being flanked by said pair of lateral trusses;

said means for collecting and discharging harvested shellfish, disposed behind said internal means for directing a flow of encountered water during a dragging operation, including a louver type grille-platform, a metal grid receptacle supported by said louver type grille-platform and a mechanism for topple over said metal grid receptacle when loaded with shellfish; and

at least a pair of sets of a multiplicity of hinged flexible flaps being used, a first, front one being attached to a lowest part of said internal means for directing a flow of encountered water during a dragging operation, where said anterior and posterior curved panels meet, while a second multiplicity of hinged flexible flaps being attached at a frontal part of louver type grille-platform.

* * * * *